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Ontario
Ministry of the Environment

Environmental Scanning Report

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Draft for Ministry Discussion
October 1989

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Environmental scanning report.

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PREFACE

The Report of the Environmental Scanning Group represents the completion of the first step of the Ministry's new Strategic Planning Process. The Scan examines the internal pressures as well as external forces and environmental trends that will affect the Ministry's activities. The Scan concentrates on those influences which will have an impact on the Ministry as we head through the 1990's and into the 21st century.

The Strategic Planning Coordinating Committee is preparing an opportunities and constraints analysis to accompany the Scan. This document will represent Step 2 of the Strategic Planning Process. It will set out the Committee's views of the significant developments in the internal and external environment. The document will also identify key opportunities, constraints and threats that should be considered as the Ministry reviews its strategy.

These documents are intended to help us as we prepare for the third step of the process, the Internal Assessment Workshop, to take place later this fall.

INTRODUCTION

This scanning report is the first effort of its kind in the Ministry of the Environment. While the Scanning Group Committee reviewed a wide range of issues, this report focusses on demands for internal resources that are likely to be faced by the Ministry over the next ten years.

The database for this report was derived primarily from five scanning group meetings. The nature of these meetings was to "brainstorm" on a number of issues in terms of their general trends and implications for the Ministry. As a result, a great variety of issues were identified but only those issues which were deemed to be the most significant are highlighted in this report.

In addition, reports from other Ministries, journal articles and public opinion polls were examined; however, future scans should peruse these external sources in a more systematic, comprehensive fashion.

Due to increased public awareness and attention to environmental issues, the Ministry will be entering a dynamic phase in which traditional policies and practices will be challenged on every point. So called "tried and true" technological solutions may not always be either politically or socially acceptable and increased attention to institutional, social and economic policy instruments will have to be included.

With this in mind, this Environmental Scanning Report is designed to identify general trends which may affect the Ministry as a whole, rather than examine the effects of these trends on current initiatives such as MISA, CAP and OWAS.

A number of trends were identified which are likely to have a major influence on the Ministry over the next ten years:

- Risk assessment and standard setting will continue to be areas of concern and will require persistent efforts.
- Global and regional transboundary environmental issues will be significant concerns.
- The protection of Ontario's air, water and ecosystem resources will require continuing efforts.
- Sustainable development will be embraced.
- A clean environment is seen as a top "Quality of Life" issue.

- Municipal and hazardous waste management will remain pressing issues and grow in importance.

- Effective public communications will be a vital component in shaping attitudes.

- Decision makers will require more direct and rapid access to technical and scientific information.

- The retention of scientific and technical experts may become increasingly difficult due to competition from other sectors.

- The Ministry will have to work within the complex system of changing human values and behaviour. Internally, the Ministry will have to contend with the changing nature of the workforce and externally, with factors such as NIMBY.

- In the face of unlimited demands, the Ministry will be challenged to effectively and efficiently utilize its limited human and financial resources.

This document is designed to stimulate thought and more detailed discussion. Moreover, the implications cited may be viewed as "starting points" for further examination. This scan and future scans will assist the strategic planning process to ensure that the Ministry is capable of managing the complex environmental problems of the future.

REPORT OF THE ENVIRONMENTAL SCANNING GROUP

SOCIAL, DEMOGRAPHIC, ECONOMIC AND GOVERNMENTAL TRENDS

PUBLIC AWARENESS

Trends

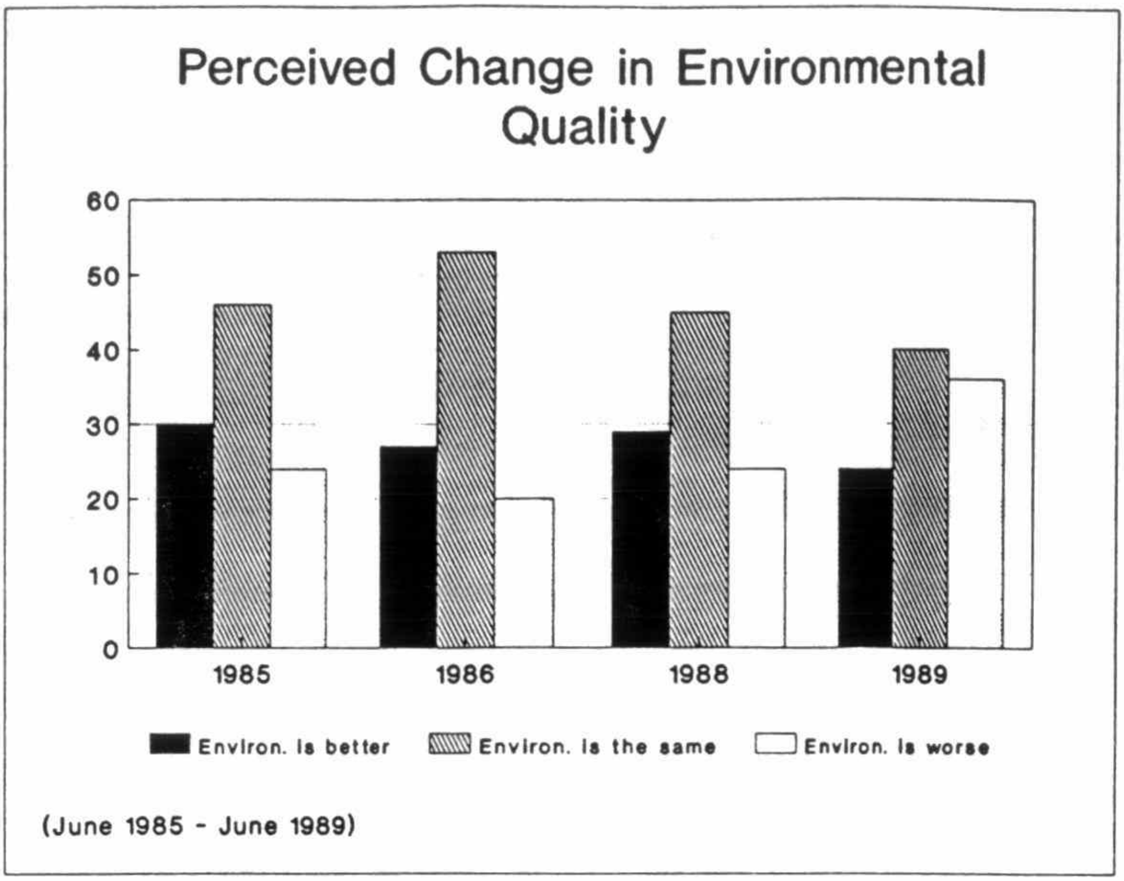
Public interest and media coverage of environmental issues has increased dramatically. Indeed, concern over the environment is rising so quickly that only economic issues such as inflation are sometimes considered by Canadians as being more important.

Individuals are becoming more conscious of their interaction with and effect upon the natural environment. They are concerned over issues of recycling, and are willing to pay (to a limited degree) more for a safer, cleaner, and healthier environment. There is a growing trend, especially in the younger population, towards conservationism.

Implications

These changes or shifts in attitudes impact the environment in numerous ways:

- Industry is beginning to respond to the public's environmental consciousness. "Environmentally safe products" are increasingly entering the marketplace.
- The social acceptance of facility siting continues to be a problem in environmental management. Members of the public and local officials can be effective in stopping a process if there is a perceived negative impact on the community, but they also assist in developing solutions which are appropriate for local conditions. The lack of social acceptance is a particular concern when trying to site landfills and other waste management facilities. Strategies to work effectively with social acceptance have been developed elsewhere, e.g. Alberta, Manitoba, Michigan, and Saskatchewan.
- Recent poll findings indicate that environmental attitudes are strongly entrenched in younger people. Distress over the condition of the environment is likely to be a long-term concern.
- Enhanced communication and education strategies will be required to meet the demands for information and to apprise the public of the Ministry's progress on selected initiatives.



Perceived Change in Environmental Quality

(June 1985 - June 1989)

* The above results were obtained from a national survey when respondents were asked the question: "Over the past several years, would you say that the quality of the environment in your area has gotten significantly better, somewhat better, stayed the same, gotten somewhat worse, or significantly worse?"

SOURCE: Decima Quarterly Report, Summer, 1989

- Since the public is increasingly scrutinizing the Ministry, specialists in public relations, conflict resolution and public consultation will be in greater demand to convey information in a comprehensible format and to interact with the growing number of interest groups and individuals.

- The Ministry will need to enhance its ability to analyze and respond to the social ramifications of current and proposed policies and programs.

This section interrelates with Waste Management, Public Communications, Risk Assessment and Standard Setting, Drinking Water and Staffing: Unlimited Demands - Limited Resources.

URBANIZATION

Trends

According to a study by the Ministry of Treasury and Economics, Ontario's population is expected to increase from its present 9.6 million to over 11.9 million by the year 2011. The bulk of this growth will be centred on the Greater Toronto Area (GTA). During this period the GTA's population is estimated to grow from 3.7 million to 5.3 million. Due to their links with the GTA, the surrounding regions of Simcoe, Dufferin, Wellington, Waterloo, and Victoria, will also have large population increases.

Implications

- There will be increased demands for centralized services in terms of sewage and water supplies. The Ministry can direct urban growth through its infrastructure development program.
- The Province's arable lands may be viewed as a "solution" for the problem of finding space for Ontario's growing population. The depletion of this non-renewable resource has widespread implications in terms of the Province's economy and food source base.
- Population expansion into rural districts will increase the stress on the Province's groundwater resources.
- Settlement patterns affect transportation needs and automobile usage. This will have significant implications for both urban and rural air quality.
- Increases in urban density will intensify the demands on waste management facilities and recycling programs.
- Urbanization tends to increase the amount of urban runoff. Urban stormwater quality management and aquatic habitat protection requires policies and management approaches on a watershed scale including inter-agency coordination with other Ministries, principally MNR.
- The Ministry may want to liaise with developers and municipalities to monitor growth trends.

This section interrelates with Cultural Diversity, Air Quality, Surface Water, Groundwater and Waste Management.

FAMILY COMPOSITION

Trends

There are a number of social and economic trends which are changing the structure of the family in Ontario. The rise in the participation of women in the paid workforce, declining numbers of children per family, and an increasing number of single parent households have altered family composition.

Implications

- Changes in family composition will have human resource implications for the Ministry. There will be an increasing need for the Ministry to help staff balance workplace and home demands - through the implementation of flex-time, on-site child care, maternity/paternity leave, job sharing and telecommuting.
- The demand for convenience goods will increase. This has ramifications in the area of waste management.
- Changes in the workforce will affect transportation requirements, which will have implications for air quality.

This section interrelates with Public Awareness, Air Quality and Waste Management.

CULTURAL DIVERSITY

Trends

The Ministry of Treasury and Economics Demographic Report notes that much of Ontario's future population growth will be attributable to immigration. At present, immigrants to Ontario originate mainly from South and Central America, Asia and Africa. This is not expected to change. Immigrants generally settle in urban areas, particularly, Toronto.

Implications

- Individuals from different cultures will bring their own attitudes towards natural resources, packaging and environmental protection.
- Managers and staff within the Ministry will need to be sensitive to the needs and values of employees and members of the public from different cultural backgrounds.
- New avenues will need to be explored in order to carry the Ministry's message to different cultural groups.

This section interrelates with Public Communications and Staffing: Changing Human Values.

NORTHERN ONTARIO

Trends

Northern Ontario, with vast land areas, low population densities and an economy that depends upon natural resource development and tourism, is quite different from the rest of the province. There is the perception in the North that provincial legislation and programs are directed at solving Southern Ontario problems without an understanding or consideration of northern concerns.

Northern Ontario also has a large Native population that is dependent upon an environment that, in many respects, is more fragile than the rest of the province. Conflicts between resource development activities and traditional Native land uses are becoming more frequent. At present, there is no effective mechanism for natives to participate in economic development. The EA Act is used increasingly, with the Province's concurrence, to secure development agreements between mining companies and local Native communities. This mechanism provides social and economic benefits to these communities.

A number of government initiatives are currently in place which have the potential to address some northern concerns. These include:

- various self-governance models being studied for their applicability to Northern Ontario; and
- tripartite negotiations involving, Ontario, Canada and the Nishinawbe Aski Nation to begin this fall with the view of sharing the Province's authority in areas or land use planning and environmental protection.

Implications

If some form of self-governance is granted to Natives and non-Natives in the North, the Ministry will have to alter its policies and programs to meet these changed circumstances.

The fragile nature of the Northern environment and the distinctive cultures of the region's native population indicate the need for:

- research directed at understanding how northern ecosystems function;
- standards which reflect the environmental sensitivity of the region and a consideration of Native culture; and

- an outreach program designed to increase native participation in program management.

This section interrelates with Sustainable Development.

INDUSTRIAL RESTRUCTURING

Trends

Ontario's economy is undergoing fundamental changes. There is strong growth in the service and some secondary manufacturing sectors compared to primary and resource industries. Related to this shift is the growing prominence of small enterprises. Indeed, much of the vibrancy of Ontario's economy can be attributed to new entrepreneurs starting up small businesses. The resource and primary manufacturing sectors, on the other hand, are marked by an increasing level of corporate concentration on a worldwide scale.

These trends are likely to continue as Ontario adjusts to an increasingly competitive world economy.

Implications

- The growing number of small and medium sized secondary manufacturing and service enterprises will affect waste generation, pose significant regulatory and enforcement problems in the Ministry's program areas, and increase the demand for and pressure on sewer facilities.
- Large multi-national corporations, in times of economic stress, are well situated to pressure governments into making environmental concessions. However, these same firms have more control over pricing, which may allow them to raise the revenues required to take effective abatement action (this point does not negate the need for regulatory and enforcement measures).
- Corporate concentration may lead to the closing of older plants using older technologies which will place increased demands in the areas of decommissioning and site clean-up.

This section interrelates with Government, Air Quality, Surface Water and Waste Management.

GOVERNMENT

Trends

Under the Canadian constitution, the federal and provincial governments have jurisdictional responsibilities for environmental protection. The federal government is seeking a higher profile and is becoming more active in environmental matters, resulting in overlap and interference with Ontario's regulatory agenda. Recent federal regulatory initiatives under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act challenge the traditional roles of the provinces; namely their responsibilities for developing emission criteria and levels for pollution sources under provincial jurisdiction.

The 1989 Communique issued by the Annual Premier's Conference reflects the higher priority of environmental issues. Areas of provincial interest include sustainable development and urban air pollution.

The United States administration is taking a more active interest in environmental issues. The proposed amendments to the American Clean Air Act will deal with acid rain by reducing 10 million tonnes of sulphur dioxide emissions from 1980 levels by the year 2000. The Bill also includes measures strengthening vehicle emission standards to reduce smog and measures to reduce air toxics.

Implications

- There will be greater pressure on the Canadian Council of Ministers of the Environment (CCME) and the CCME Deputies to resolve federal-provincial differences. Staff resources will be needed to develop, monitor and ensure implementation of the federal initiatives under CCME. Ongoing initiatives include:

    1. Harmonizing federal and provincial roles and responsibilities i.e. developing general principles of a national partnership between the federal and provincial governments in managing hazardous and toxic substances.

    2. Developing standards and objectives for chemicals, and harmonizing federal and provincial regulations.

- Ministry staff will be required to monitor U.S. interest in environmental protection to determine potential transboundary effects on Ontario, foster improved relationships with neighbouring jurisdictions, and ensure the compatibility of environmental standards, regulations, and monitoring programs.

This section interrelates with Sustainable Development, Surface Water and Air Quality.

SCIENCE AND TECHNOLOGY

BIOTECHNOLOGY

Trends

Biotechnology is a rapidly developing field which has economic potential for Ontario. Some of the demands being made of this technology include, finding solutions to waste management problems, exploring alternatives to pesticides and counteracting pollutants.

Biotechnology can involve altering genetic material. There are many concerns associated with this area, however. Inherent in the manipulation of the genetic code of living organisms is the danger of human and/or ecological damage.

Implications

- A priority issue is the formation of an overall policy governing the utilization and restraints of biotechnology applications/techniques. The policy should delineate jurisdiction and provide guides on risk assessment and standard setting.

- The Ministry will need to develop in-house expertise to monitor and to interpret the environmental implications of biotechnology.

- As the types and levels of pollutants appear limitless, there is a growing need for new monitoring techniques/capabilities to track releases and evaluate effects. To ensure adequate analytical capabilities, faster information exchange between universities, industry, and government must be facilitated.

- While biotechnology methods may be perceived as less harmful alternatives to pesticides, the point must be stressed that altering genetic material carries its own hazards to agriculture, livestock, and people.

This section interrelates with Staffing: Scientific and Technical Expertise, Risk Assessment and Standard Setting, Integrated Ecological Management and Government.

RISK ASSESSMENT AND STANDARD SETTING

Trends

A number of trends are complicating the Ministry's task in assessing the risks posed by toxic contaminants, and in establishing environmental standards for such contaminants. The issue of assessing risk concerns an expanding array of organizations involved in health and environmental protection. Endpoints other than cancer are increasingly being explored. For instance, scientists are now studying the effect of toxic chemicals on the immune and neurological systems. The assessment of risks for environmental contaminants and developing standards will be further complicated by the demands of special subgroups such as the environmentally hyper-sensitive.

The public expects the Ministry to speak with authority as to the levels of a given contaminant that is permissible in the environment, and yet is often skeptical of Ministry pronouncements. Despite, a number of new techniques and tools under development which will improve the capability of toxicologists to assess risks, the complexity of the issues involved will impede the Ministry from providing definitive answers to all the problems it faces.

Implications

- Standardized databases are a prerequisite in improving the efficiency, proficiency and quality of the Ministry's efforts towards assessing risks and establishing environmental standards.
- There is a need to improve communication and coordination between regulatory organizations in order to prevent a massive duplication of effort.
- Risk assessment and standard setting will continue to involve assumptions and human choices and therefore multi-disciplinary teams should be involved in risk assessment and communications.
- The Ministry will be increasingly in the position of having to defend its decisions before judicial and quasi-judicial bodies.

- The public is increasingly demanding access to environmental information. Often, however, the public lacks the expertise to interpret this data. The Ministry will need to work towards making its findings and rationales understandable to the public.

This section interrelates with Public Communications and Scientific and Technical Expertise.

RESEARCH AND DEVELOPMENT

Trends

New Developments in all areas of science are occurring at a tremendous rate. Innovative products, materials and industrial processes can appear with little notice. Developments in these areas can affect the environment by introducing new contaminants, by creating atypical waste management issues, and by overloading the capacity of existing systems. In addition many currently unidentified contaminants may eventually be found to be harmful to the environment and/or to human health.

To deal with the above issues requires a strong commitment to an ongoing Research and Development Program. To perform the required work demands a multi-faceted program involving individual Branches and Regions, The Research and Technology Branch research grants program, cooperative work with other agencies and the creation of multi-disciplinary research teams.

Implications

A strong commitment to Research and Development in key areas will keep the Ministry at the leading edge of environmental research and will help retain the top professionals needed to solve new environmental problems of increasing complexity. The Ministry should examine the need to:

- assess key areas where it should maintain or develop Research and Development activities;
- protect Research and Development programs for erosion as a result of routine work demands;
- promote continuous literature review and frequent contacts with experts in other agencies to provide an early warning of new environmental issues; and
- encourage Ministry staff to publish their Research and Development results in peer-reviewed journals and at conferences in order to solidify their standings as recognized experts.

This section interrelates with Biotechnology, Risk Assessment and Standard Setting and Staffing, and Internal and Public Communications.

THE GLOBAL ENVIRONMENT

Trends

In the latter half of this century, we have begun to notice that our lifestyle has a direct and noticeable impact on the environment in which we live. A number of symptoms of our lifestyle choices have surfaced. If current trends continue, we may push our environment beyond the point of no return. There is increasing recognition that cooperation between countries is needed to effectively address environmental problems. These problems are not subject to geo-political or artificial boundaries. They affect all nations regardless of their form of government and standard of living.

Acid rain has become increasingly problematic. It is formed as a result of sulphur and nitrogen oxides produced primarily by fossil fuel combustion in smelting industries, power plants and automobile exhaust. Once in the earth's atmosphere, chemical reactions convert the emissions into sulphates and nitrates that return to the earth in precipitation. Acid deposition can destroy aquatic systems, affect vegetation and soil, and corrode a variety of materials. Ontario is both an emitter and receiver of acid rain as prevailing winds often carry sulphates and nitrates over great distances.

In recent years, a number of scientific studies have provided conclusive evidence that the **ozone layer**, which plays an important role in protecting the earth from damaging ultraviolet radiation, is being depleted. This results primarily, but not solely, from increased emissions of chlorofluorcarbons into the earth's atmosphere. Scientific findings show that the instances of skin cancer and blindness will increase dramatically in the coming years. Increased radiation also affects animals and plants.

Another concern is the connection between CO_2 emissions and **global warming**. Global temperature has been increasing measurably for decades and the rate is expected to accelerate. Debate continues over how much the warming will increase and how fast. Because of the CO_2 issue, **deforestation** is currently becoming an international concern.

Implications

The Ministry must address global problems in conjunction with other levels of government, industry and non-governmental organizations. A coordinated effort is needed. The Ministry should demonstrate enhanced leadership and involvement in:

- international standard setting activities;
- communicating data and research findings with the aforementioned organizations; and
- ecological research - concentrating on understanding the basic structure of ecosystems and on investigating how long-term, subtle changes in the atmosphere will affect future productivity.

This section interrelates with Sustainable Development, Air Quality, Energy and Public Awareness.

THE ONTARIO GOVERNMENT

WASTE MANAGEMENT

Trends

The increased profile of waste management as an issue affecting individual citizens specifically as well as municipalities and industry generally has focussed interest on two concerns: capability and capacity. Three problems related to both of these concerns are the siting, operation and decommissioning of landfills and other waste management facilities. If current trends continue, these three features of waste management will occupy a top position in the eyes of both the public and Ministry.

Landfills and other waste management facilities are becoming increasingly difficult to site, primarily due to the social acceptance of facility siting related environmental and health concerns. For instance, leachate from landfills has the potential to contaminate both surface and groundwater if remedial action is not implemented quickly.

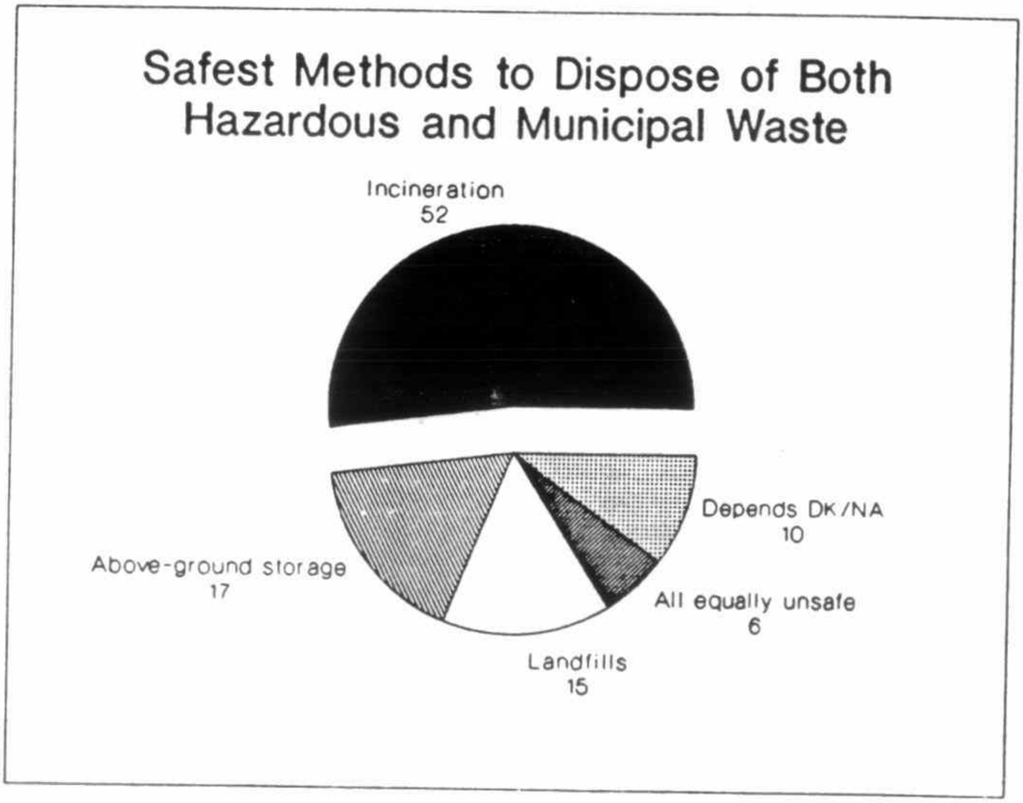
In order to reduce the province's dependence on landfills and other traditional waste management options, the Ministry is promoting initiatives to recycle goods which are receiving growing public support. The establishment of markets for recycled goods will continue to be an issue of concern for the Ministry. The 3Rs (reuse, recycle and reduce) initiatives are likely to result in a change in attitude toward waste generation and management. Ontario Waste Abatement Strategy (OWAS) programs will be coming on stream in the next 10 years.

Implications

Landfills, incinerators and other traditional waste management facilities are no longer inexpensive means of waste disposal. The public is becoming increasingly involved in organized opposition groups. The Ministry should therefore assess and examine the need to allocate more resources to:

- assess the viability of landfills in terms of long-term safety i.e. examine air quality and the effects of leachate on ground and surface water, and monitor the surrounding public's attitudes and perceptions towards landfills;
- study the NIMBY phenomenon and investigate ways to positively integrate the public's concerns into waste management planning;

- liaise with industry to develop both products that use less packaging, and markets for recycled products;
- assess the possibility of limiting the project planning phase - including design and implementation to a specified period in EA's;
- work with the Ministry of Education to develop comprehensive strategies and programs for education on waste management;
- Since there appears to be a great difference in views of acceptability of waste management alternatives between the public and the Ministry, MOE should examine the public's preference for incineration especially in view of recent advances in Europe and Florida (Water and Pollution Control, August 1989).


Safest Methods to Dispose of Both Hazardous and Municipal Waste

* The above results were obtained when respondents were asked the question: "Which of these three methods, landfills, above-ground storage or incineration do you think is the safest in terms of protecting people's health and the environment?"

SOURCE: The Environmental Monitor, Spring, 1989

- develop a results management system for tracking and ensuring the success of recycling initiatives, and for adjusting programs if necessary;
- continue to encourage the 3Rs of waste management; and
- recognize the capability of existing industrial facilities to handle stored and produced waste i.e. cement kilns could render innocuous most of the chlorinated organics including PCB's in existence in the Province.

This section interrelates with Urbanization, Public Awareness, Public Communication and Family Structure.

ENERGY ISSUES

Trends

Energy and environmental issues are inextricably linked. Canada has one of the highest per capita energy consumption rates among developed countries. The environmental impact of acid rain, carbon dioxide emissions (i.e., greenhouse effect), which are exacerbated by high energy consumption, are major pressures for reducing overall energy demand, improving energy efficiency and utilizing clean technologies.

Implications

- Although the promotion of energy efficiency is within the purview of the Ontario Ministry of Energy, the Ministry of the Environment can influence fundamental decisions about Ontario's energy choices through the environmental assessment process (particularly if it is applied to Hydro's overall energy planning strategy).

This section interrelates with Sustainable Development, and Global Issues.

SURFACE WATER

Trends

Ontario's lakes and rivers have long been considered one of the Province's most precious and inexhaustible resources. Unfortunately, industrial and municipal pollution, increasing urbanization and changing agricultural practices have introduced persistent toxic chemicals into provincial waterways. In certain areas with high population and industrial concentrations, water quality has deteriorated significantly.

Implications

- There is a need to enhance the capability to develop integrated water management strategies for priority watersheds that would address specific point source problems, non-point source pollution, sediments, groundwater, areas of concern, and local development, based on provincial watershed management objectives. These should be developed with public input. Members of the public use the quality of rivers and creeks as a standard by which to judge the state of the environment in general - these are their local benchmarks.

- The development and refinement of methods for long-term trend assessment across the province will enhance the ability to track improvements in water quality as a result of existing and future abatement actions.

- Evidence indicates that atmospheric deposition is a major pathway of toxic chemicals into provincial waterways. More monitoring is required to quantify the magnitude of this problem.

- From a technical perspective, the shift to regulation-mandated monitoring, drinking water assessment and site-specific RAP studies is increasing and will continue to increase the workload performed by Ministry labs. It may be necessary to rely more on external contract labs to meet additional demands.

This section interrelates with Urbanization, Groundwater, Industrial Restructuring and Staffing: Scientific and Technical Expertise.

GROUNDWATER

Trends

At present, approximately 25-30% of Ontario's population is dependent on groundwater sources of drinking water. This figure is likely to increase given that the population base is expanding into rural and semi-rural areas. At present, urban run-off, industrial and municipal operations, waste storage and disposal sites, agricultural activities and transportation routes affect groundwater aquifers. This is a pressing concern that has been identified by numerous sources and is likely to become more prominent within the next five years.

Implications

Given this significant dependence on groundwater, the Ministry must develop and renew its commitment to the formulation of a comprehensive groundwater policy and related programs. The Ministry should then examine and assess the need to allocate more resources to:

- groundwater quality monitoring programs;
- a compilation of on-line baseline statistics on groundwater use and well drilling throughout the province;
- the development of guidelines and standards on groundwater quality and site-specific use;
- liaise with other agencies and levels of governments on the latest developments in groundwater theory and techniques;
- assess the effects of contaminants e.g. pesticides and their lifespan within the groundwater medium; and
- develop groundwater information systems, e.g., water quality and quantity maps.

This section interrelates with Urbanization and Surface and Drinking Water.

DRINKING WATER

Trends

Safe drinking water was recently listed as the second highest priority among the public after waste management. Urban residents in particular have increasing concerns about the purity of their drinking water and are turning to bottled water sources.

Implications

Since a large portion of Ontario's population relies on surface water and given the significant concern about the quality of drinking water the Ministry should:

- examine why the public is increasingly using bottled water and modify its communications strategies accordingly, if necessary;
- develop enforceable drinking water standards;
- encourage the public to use water more efficiently; and
- develop source protection strategies.

This section interrelates with Public Communications, Surface and Ground Water and Urbanization.

AIR QUALITY

Trends

Air quality remains a major concern for the public and the Ministry. Although significant improvements have been achieved in some point source cases, there is growing concern about air quality in major urban centres as population density increases and urban limits expand. This is reflected in the increasing incidence of respiratory ailments and associated health implications. There are also growing concerns regarding transboundary pollutants, toxic organics and other global/climatic contaminants that are emitted and migrate long distances into rural areas, where they directly or indirectly impact on crops, forests and other components of the terrestrial and aquatic ecosystem.

Implications

- There will be added pressures to ensure that the quality of the air in Ontario is sufficient to support a healthy and productive ecosystem and agricultural industry that can be preserved for future generations. This will require continued efforts in air and ecosystem monitoring to ensure that emission control programs are achieving the desired effects.

- Because of the transboundary nature of many of the air quality issues, there will need to be enhanced efforts to ensure that monitoring and other diagnostic programs reflect the global nature of the problem. This will require a much more interdisciplinary approach, sharing of database results, a high degree of scientific expertise within the Ministry and inter-agency cooperation on the international level.

This section interrelates with Urbanization, Industrial Restructuring, Global Issues, Sustainable Development Non-Point Source Pollution and Government.

NON-POINT SOURCES OF POLLUTION

Trends

An area where the Ministry will need to develop a comprehensive management strategy is in the area of non-point source pollution. While, it is very difficult to monitor and regulate this form of pollution, it nevertheless, remains an important issue for the Ministry to address.

The Ministry's 1987 Management by Results Report notes that loadings of total phosphorus and suspended solids from agricultural sources to the Great Lakes are estimated to be over six times greater than from industrial discharges. Also, vehicular emissions of sulphur dioxide, nitrogen oxides, carbon monoxide, hydrocarbons and particulates are estimated to be almost three times greater than that of industry.

Implications

- Some of the environmental problems facing the Ministry cannot be solved without dealing with non-point sources.
- Controlling non-point source pollution will be extremely difficult. Measures likely will involve altering the lifestyle choices of the public. Moreover, the cost of these measures to the public in terms of dollars and inconvenience will be direct.

This section interrelates with Air Quality, Industrial Restructuring, Surface Water, Groundwater and Pesticide Use.

PESTICIDES USE IN AGRICULTURE

Trends

A significant achievement in the area of food production has been the ability of farmers to increase the crop yields to feed an exponentially growing world population. Current production rates and farm practices depend on the heavy use of pesticides and fertilizers. Another significant trend in today's urban society is the heavy use of chemicals for achieving the perfect lawn and garden.

The public is increasingly concerned about the implications of pesticide use to both their health and the environment. In particular, pesticide residues in food have triggered consumer boycotts and an increasing shift towards organic producers.

Implications

- Pesticides are a significant non-point source pollution problem. Many pesticides reside in the soil where they become attached to soil particles. Erosion can transport sediment particles with their attached contaminants to a watercourse, where they become available to the aquatic food chain. Organic farming and/or reductions in the use of pesticides and adoption of practices that reduce soil erosion will contribute to improvement in water quality in surface and groundwaters.

- Inter-Ministry cooperation and federal government assistance will be necessary as the public demands for information on residual pesticides in foodstuffs increase. A multi-media campaign (one which considers how chemicals move amongst different environmental media, e.g. air, soil, food, water) aimed at the toxins in foods and the pathway of human exposure must meet consumer concerns over the effects of chemicals on food.

- Any ensuing policy must define precisely and clearly what is meant by "organically grown". Interactive cooperation between OMAF and Environment Canada can be used to monitor and regulate progress in the use of biotechnology methods and pesticides. Within this framework, educational programs developed can address issues providing information to the Ministry staff and to the public.

- The public will increasingly question the use of pesticides and demand strong regulatory action by both the federal and provincial governments.

This section interrelates with Surface Water, Groundwater, Non-Point Source Pollution and Biotechnology.

ENVIRONMENTAL MANAGEMENT ISSUES

INTEGRATED ECOLOGICAL AND RESOURCE MANAGEMENT

Trends

Environmental professionals, academics and environmentalists are calling increasingly for a more integrated approach to ecological management. This campaign results from a recognition that the different media of the environment interact with each other, and a realization that piecemeal ecological management can lead to undesirable effects or consequences.

For instance, there is an increasing awareness amongst scientists and regulators that many chemicals behave in complex ways in the environment; releases to air can end up in water, soil and the food chain. Therefore, consideration only of an air emitted contaminant misses a major part of potential environmental problems. Development of environmental standards using a multi-media approach (which considers how contaminants move amongst different environmental media (e.g. air, soil, food, water) and evaluates total human and/or environmental exposures from all exposure routes and pathways) provides an effective integrated environmental management tool.

Implications

- While an integrated ecological approach may address the complexity of environmental issues, it may also increase the complexity of the solutions.
- An integrated approach would entail at a minimum more inter-branch cooperation, and at maximum restructuring the organization, i.e. no longer considering environmental problems on a single medium by medium basis.
- A multi-media approach may require the Ministry to review and change some of the existing standard setting processes.

This section interrelates with Staffing, Public Communications Internal Communications and Sustainable Development.

SUSTAINABLE DEVELOPMENT

Trends

Sustainable development is a general philosophy endorsed by the Brundtland Commission. The notion concentrates on the holistic ramifications of development and environmental degradation: without a healthy environment, there cannot be a healthy economy.

The concept of Sustainable Development has generated extensive activity as all levels of governments attempt to develop a practical definition of this philosophy.

Implications

- Overall responsibility for translating the philosophy of Sustainable Development into a strategy for Ontario rests with the Round Table on the Environment and the Economy. The Ministry's concern will be to develop the environmental quality protection component of the strategy for air, water and waste, including long-term goals, objectives, specific means and monitoring mechanisms (e.g. State of the Environment reports).
- Practical applications of Sustainable Development will have to consider regional variations. For instance, what does this concept mean in Northern Ontario - a region which depends on the extraction of non-renewable resources.

This section interrelates with, Urbanization, Northern Ontario, The Global Environment Energy and Ecological Management.

PUBLIC COMMUNICATIONS

Trends

The field of environmental study has grown dramatically as a result of increasing concern and evidence of despoliation. The Ministry must interact with an increasing number of external groups including industry, the media, academia and non-governmental agencies. As the public becomes more interested and concerned with environmental issues, they increasingly turn to the Ministry for answers.

Implications

An integral component of ecological management is communication. The Ministry is faced with having to reassess its role in this area. Long-term shifts in attitude occur as a result of effective communication and education strategies, and not simply from regulation.

The Ministry should then examine and assess the need for:

- Defining the Ministry's corporate communication, information and public education priorities.
- Targeting audiences for the above and finding the most effective means to reach those audiences (such means to be reviewed should include a separation of what communications activity the Ministry will provide and how it will support other government and non-government organizations as partners in communication efforts).
- On the basis of the two steps above, the Ministry should develop a comprehensive public communication and education strategy; it would entail:
  (1) working with Ministry of Education officials to devise ways to convey positive messages to young people; and
  (2) better cooperation with universities, the media and non-governmental organizations.
- Defining an information system or approach which allows the Ministry to determine its ongoing information needs

(implicit in this approach would be a system which evaluates the success rate of meeting these requirements).

This section interrelates with Public Awareness, Internal Communications, Staffing and Risk Assessment and Standard Setting.

INTERNAL COMMUNICATIONS

Trends

With the move towards an information based society, knowledge and information are becoming increasingly important assets. Because a myriad of factors must be taken into consideration before making informed decisions, Ministry staff need to have access to timely and accurate information. This is becoming difficult, however, as the amount of data and material that needs to be considered increases.

Given these developments, and the complexity of government, the communication of ideas and information is of great concern.

Implications

If current trends continue, decision-makers will not be exposed to the information needed for them to best carry out their jobs. The Ministry should examine and assess the need for:

- examining and assessing the information demands of staff members, and the possibility of creating centralized services for on-line data searches, journal retrievals and inter-library loans;
- exploring multi-disciplinary inter-branch approaches to collect and share data;
- hiring and training expert staff to interpret this larger information base, i.e. ensuring that the Ministry has trained operators, technicians, system analysts and technical experts; and
- liaising with industry, other Ministries and other non-governmental organizations for the purpose of sharing databases.

This section interrelates with Risk Assessment and Standard Setting, Biotechnology, Public Communication and Staffing.

STAFFING - SCIENTIFIC AND TECHNICAL EXPERTISE

Trends

Solving today's and tomorrow's environmental problems will require scientific and technical experts. Diverse analytical techniques are being employed in order to detect pollutants, monitor toxic changes and grasp the complexity of ecosystem functioning. In addition, the demands of the regulatory process are changing. An involved public expects the Ministry to document, communicate and defend proposed policies and regulations. The credibility of the Ministry will depend on the credibility of its experts.

It will become more difficult to attract the required complement of qualified personnel to the Ministry in the future. The workforce is growing at a slower rate, many highly-trained professional and technical staff will soon retire, and the external demand for individuals with an expertise in environmental issues is expanding. The Ministry must actively compete with the private sector for technical experts.

Implications

In order to assure that the Ministry has available the required technical expertise it should:

- liaise with universities and community colleges in the province and encourage changes in curricula that would keep up with the increasing demand for expertise in all areas that fall within the purview of the Ministry. Also, the Ministry should sponsor more co-op or work/ study programs where students gain experience working within the Ministry throughout the year.
- sponsor more in-house training sessions for staff. In this way, staff members who wish to expand their job responsibilities can be identified for developmental opportunities such as secondments, job rotations, acting appointments and promotions.
- develop policies and practices that foster greater responsibility and flexibility among staff while ensuring that organizational effectiveness and efficiency are maintained. For example, a variety of work alternatives, flexible benefits plans, job enrichment schemes, sabbatical leaves and new pay systems rewarding performance rather than time worked, will attract and retain good people in the organization.

- allow for increased career development opportunities within the scientific and technical streams. The concept of parallel streaming should be reviewed in all specialist areas.

This section interrelates with Biotechnology, Integrated Ecological Management, Internal Communications, Risk Assessment and Standard Setting.

WORKING WITHIN THE COMPLEX SYSTEM OF CHANGING HUMAN VALUES AND BEHAVIOUR

Trends

At present, the Ministry's regulatory focus is not easily adapted to "soft" solutions. Nevertheless, in the future, the Ministry will need to balance technical proficiency against the need for more expertise in areas such as public communication and social science.

Implications

The Ministry should examine and assess the need to allocate more resources to:

- equipping staff with the skills to understand the social implications of environmental issues since public participation in the resolution of environmental issues will increase in the future.

- developing and implementing ongoing training programs - especially in the technical fields - to increase the level of understanding of social issues.

- approaching the federal government for funds to develop training programs. Cost-sharing could be implemented by liaising with other government Ministries, government agencies, and educational institutions in the development of these training courses.

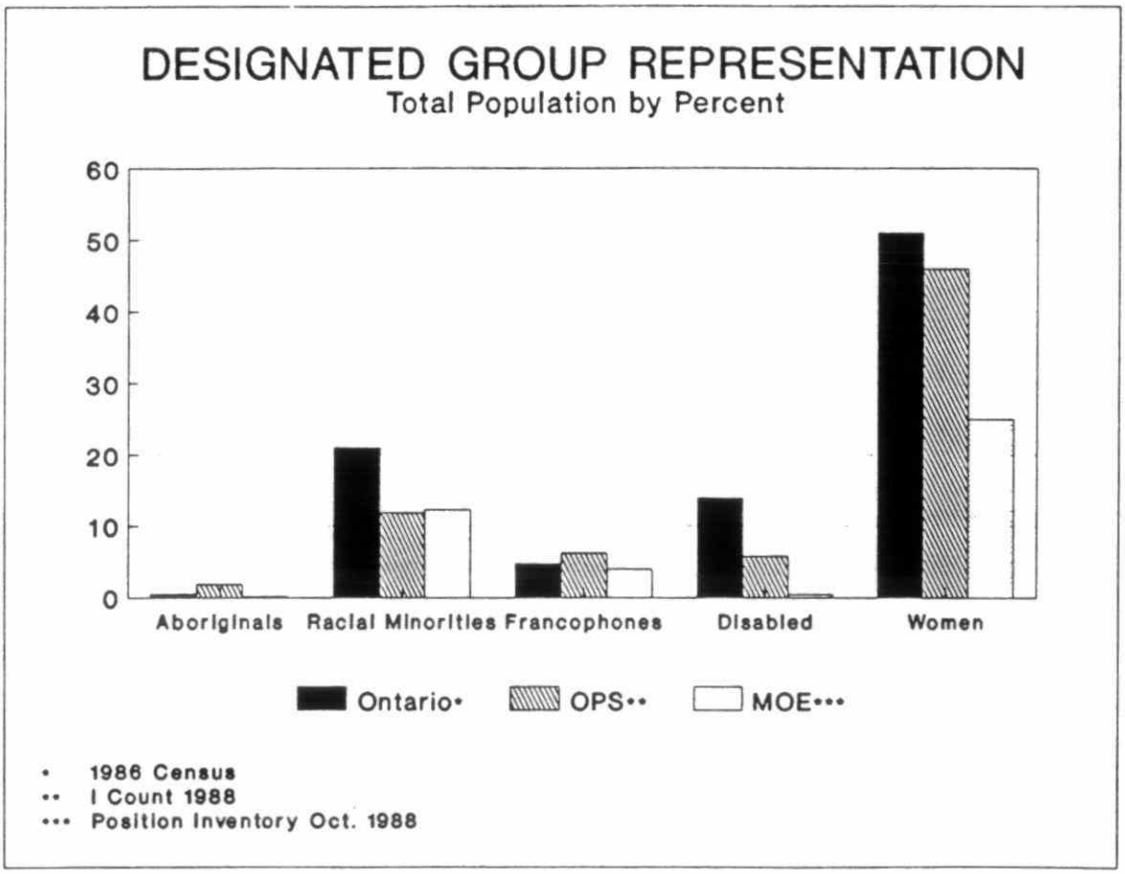
This section interrelates with Public Awareness and Integrated Ecological Management, Internal and Public Communications.

EMPLOYMENT EQUITY

Trends

In 1987, a new Employment Equity Program was introduced by the Government of Ontario. As part of the "Strategies for Renewal" Program of the Human Resources Secretariat, the new Program expanded its predecessor's focus on the integration of women into the workforce, to include racial minorities, aboriginal peoples, francophones and disabled people. The Ministry of the Environment is committed to this program.

The expanded Employment Equity Program is designed to ensure that Ontario's workforce reflects the diversity of its population. However, current figures indicate that the representation of these designated groups within the Ministry is considerably below both that of the general population and of the Ontario Public Service as a whole (see table below).



- • 1986 Census
- •• I Count 1988
- ••• Position Inventory Oct. 1988

Implications

The challenge posed by Employment Equity to the Ministry is to:

- examine current policies and practices and removing barriers that may block career progression among members of the aforementioned designated groups;
- assist members of the designated groups to become qualified for management and other more challenging positions (e.g. cross-training, developmental assignments and training courses); and
- locate highly skilled staff among all designated groups within the current climate of competing against more lucrative opportunities in the private sector.

This section interrelates with Family Composition, Public Awareness, Staffing and Internal Communications.

UNLIMITED DEMANDS - LIMITED RESOURCES

Trends

The public is demanding that the Ministry do more towards improving the environment. Indeed, despite recent initiatives such as CAP, MISA, and OWAS, the public still perceives that the government is not doing enough. Despite these demands the Ministry must work with limited resources.

As a result, there is an increasing gap between the public's expectations of the Ministry, and the technological, administrative and budgetary parameters within which the Ministry must operate. This gap is becoming a source of stress and a cause for poor morale within the Ministry.

Implications

- The Ministry of the Environment is increasingly perceived within the organization as being "the Ministry of Everything". The Ministry's resources are stretched too thinly over too many areas, and this is likely to continue unless its role is clearly delineated i.e. jurisdiction between MOE, MOL, MOH, MNR and OMAF.
- The Ministry will need to integrate project and human resource managerial approaches as a way of dealing with stress within the organization.
- There is a need to develop a clearer and more concise mandate. This mandate should focus on a limited number of realistic achievables.
- The Ministry should emphasize program evaluation since there is an increasing need to demonstrate progress. Milestones should be established and communicated.
- MOE needs to establish a comprehensive framework of priorities on environmental issues and indicate where resources can be used more effectively.
- Facilitate inter-branch and inter-section communication and rationalize job tasks - there must be integration and coordination between all levels in a branch or section.

This section interrelates with Public Awareness, Public and Internal Communications and Staffing.

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